

**LISTING OF THE CLAIMS**

*The following listing of claims replaces all prior versions.*

**1 (CURRENTLY AMENDED).** A current-voltage transforming circuit comprising:

a photo detector generating a photo current in response to a photo signal inputted into the photo detector;

an amplifier amplifying the photo current received from the photo detector;

an emitter follower coupled to the amplifier;

an output buffer coupled to the emitter;

a current detecting limiter unit having an input terminal and an output terminal to output a limiter current when an output current of the amplifier is greater than a predetermined reference value; and

a feedback resistor coupled between the input of said amplifier and the output of [of] said output buffer;

wherein the input terminal of the current detecting limiter unit is coupled to a junction between the emitter follower and the output buffer.

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**4 (ORIGINAL).** The circuit of claim 1, wherein the output terminal of the current detecting limiter unit is coupled to an input of the amplifier.

**5 (ORIGINAL).** The circuit of claim 1, wherein the output terminal of the current detecting limiter unit is coupled to ground.

**6 (CURRENTLY AMENDED).** [The circuit of claim 1, wherein the amplifier comprises:]

A current-voltage transforming circuit comprising:

a photo detector generating a photo current in response to a photo signal inputted into the photo detector;

an amplifier amplifying the photo current received from the photo detector;

an emitter follower coupled to the amplifier;

an output buffer coupled to the emitter;

a current detecting limiter unit having an input terminal and an output terminal to output a limiter current when an output current of the amplifier is greater than a

predetermined reference value;

a feedback resistor coupled between the input of said amplifier and the output of said output buffer; and

a differential amplifier receiving an input voltage of the photo current generated from the photo detector and a reference voltage.

**7 (ORIGINAL).** The circuit of claim 6, wherein the differential amplifier comprises a pair of differential transistors and first and second biases supplied to the differential transistors.

**8 (CURRENTLY AMENDED).** [The circuit of claim 1, wherein the current detecting limiter unit comprises:]

A current-voltage transforming circuit comprising:

a photo detector generating a photo current in response to a photo signal inputted into the photo detector;

an amplifier amplifying the photo current received from the photo detector;

an emitter follower coupled to the amplifier;

an output buffer coupled to the emitter;

a current detecting limiter unit having an input terminal and an output terminal to output a limiter current when an output current of the amplifier is greater than a predetermined reference value;and

a feedback resistor coupled between the input of said amplifier and the output of said output buffer;

wherein said current limiter unit includes

a voltage source;

first and second resistors;

a first transistor having collector coupled to the voltage source, a base receiving the output current, and an emitter coupled to the first and second resistors; and

a second transistor having a collector coupled to receive a current from one of the emitter follower and the output buffer, an emitter coupled to output the limiter current, and a base coupled to a junction between the first and second resistors.

**9 (ORIGINAL).** The circuit of claim 8, wherein the first and second transistors comprise:

an NPN type transistor.

**10 (ORIGINAL).** The circuit of claim 8, wherein the second transistor is turned on

when  $V_{b2} > V_{REF} + V_{beq2}$  where  $V_{b2}$  is a voltage of the junction,  $V_{REF}$  is a reference voltage, and  $V_{beq2}$  is a base and emitter voltage of the second transistor.

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**12 (PRESENTLY AMENDED).** [The circuit of claim 11,] A current-voltage transforming circuit comprising:

a photo detector generating a photo current in response to a photo signal inputted into the photo detector;

an amplifier amplifying the photo current received from the photo detector;

an emitter follower coupled to the amplifier;

an output buffer coupled to the emitter;

a current detecting limiter unit having an input terminal and an output terminal to output a limiter current when an output current of the amplifier is greater than a predetermined reference value;and

a feedback resistor coupled between the input of said amplifier and the output of said output buffer;

wherein the output terminal of the current detecting limiter unit includes:

first and second sub-output terminals coupled to the amplifier and ground,  
respectively; and

wherein the current detecting limiter unit comprises:

a voltage source;

first and second resistors;

a first transistor having collector coupled to the voltage source, a base receiving the output current, and an emitter coupled to the first and second resistors; and.

a second transistor having a collector coupled to receive a current from one of the emitter follower and the output buffer, an emitter coupled to the first sub-output terminal, and a base coupled to a junction between the first and second resistors.

**13 (CURRENTLY AMENDED).** The circuit of claim [11] 12, wherein the current detecting limiter unit further comprises:

[a voltage source;

first and second resistors;

a first transistor having collector coupled to the voltage source, a base receiving the output current, and an emitter coupled to the first and second resistors;

a second transistor having a collector coupled to receive a current from one of the emitter follower and the output buffer, an emitter coupled to the first sub-output terminal, and a base coupled to a junction between the first and second resistors; and]

a third transistor having a collector coupled to receive the current from one of the emitter follower and the output buffer, an emitter coupled to the second sub-output terminal, and a base coupled to a junction between the first and second resistors.

**14 (CURRENTLY AMENDED)** The circuit of claim [11] 12 wherein the second resistor comprises:

a variable resistor.

**15 (CURRENTLY AMENDED).** [The circuit of claim 1,] A current-voltage transforming circuit comprising:

a photo detector generating a photo current in response to a photo signal inputted into the photo detector;

an amplifier amplifying the photo current received from the photo detector;

an emitter follower coupled to the amplifier;

an output buffer coupled to the emitter;

a current detecting limiter unit having an input terminal and an output terminal to output a limiter current when an output current of the amplifier is greater than a predetermined reference value; and

a feedback resistor coupled between the input of said amplifier and the output of said output buffer;

wherein the current detecting limiter unit [comprises] includes :

a voltage source;

first and second resistors;

a first transistor having collector coupled to the voltage source and the first resistor, an emitter coupled to ground and the second resistor, and a base coupled to receive the photo current; and

a second transistor having an emitter to receive a current from one of the emitter follower and the output buffer, a collector coupled to output the limiter current, and a base coupled to a junction between the first resistor and the first transistor.

**16 (ORIGINAL).** The circuit of claim 15, wherein the first transistor comprises an NPN type transistor, and the second transistor comprises a PNP type transistor.



**17 (ORIGINAL).** The circuit of claim 15, wherein the current detecting limiter unit comprises:

a third transistor having a base connected to the collector of the second transistor, a collector connected to the emitter of the second transistor, and an emitter coupled to output the limiter current.

**18 (ORIGINAL).** The circuit of claim 17, wherein the third transistor comprises an NPN type transistor.

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